

E. R. Addison.

Nut Machine.

N^o 89,108.

Patented Jul. 21, 1868.

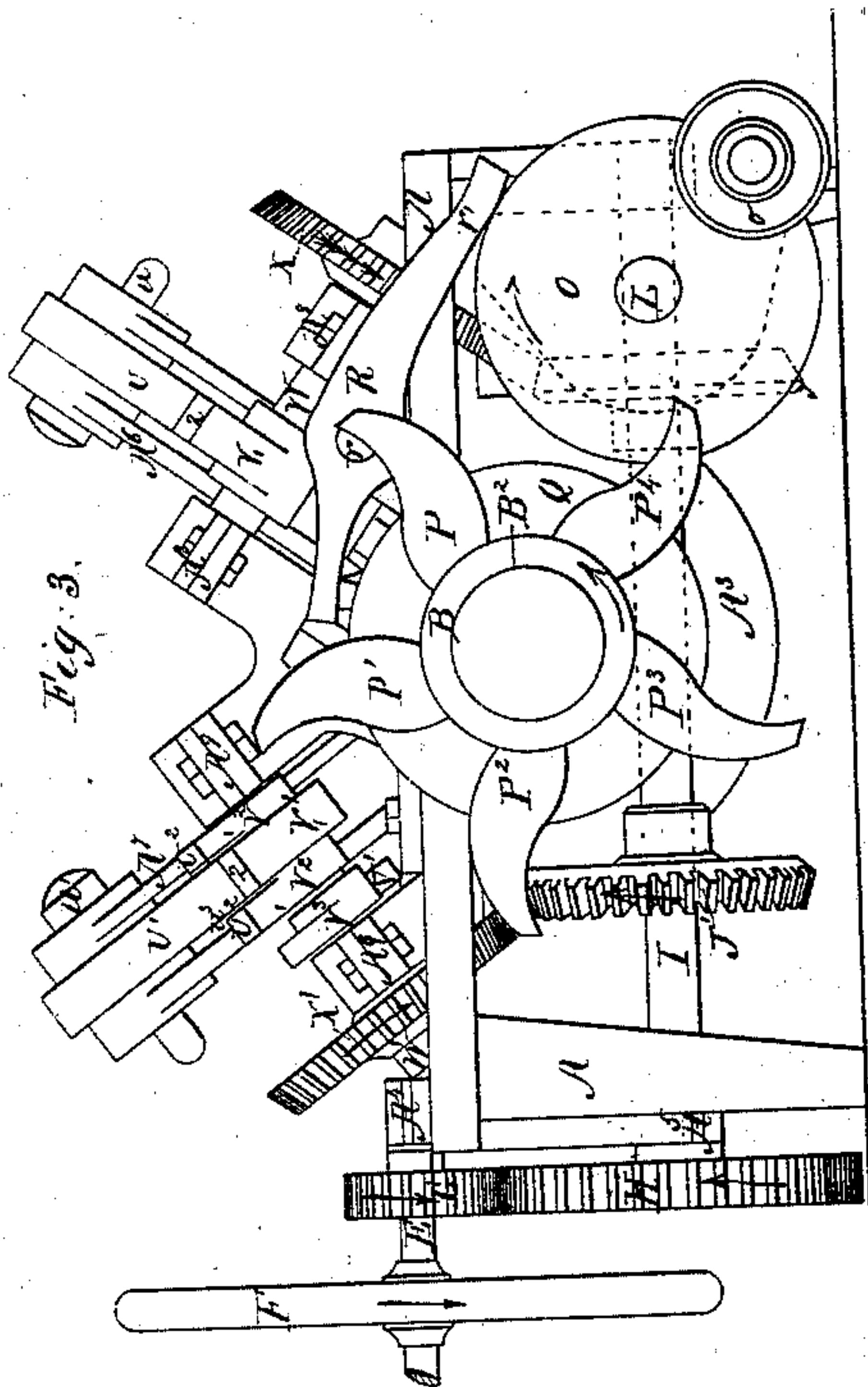


Fig. 3.

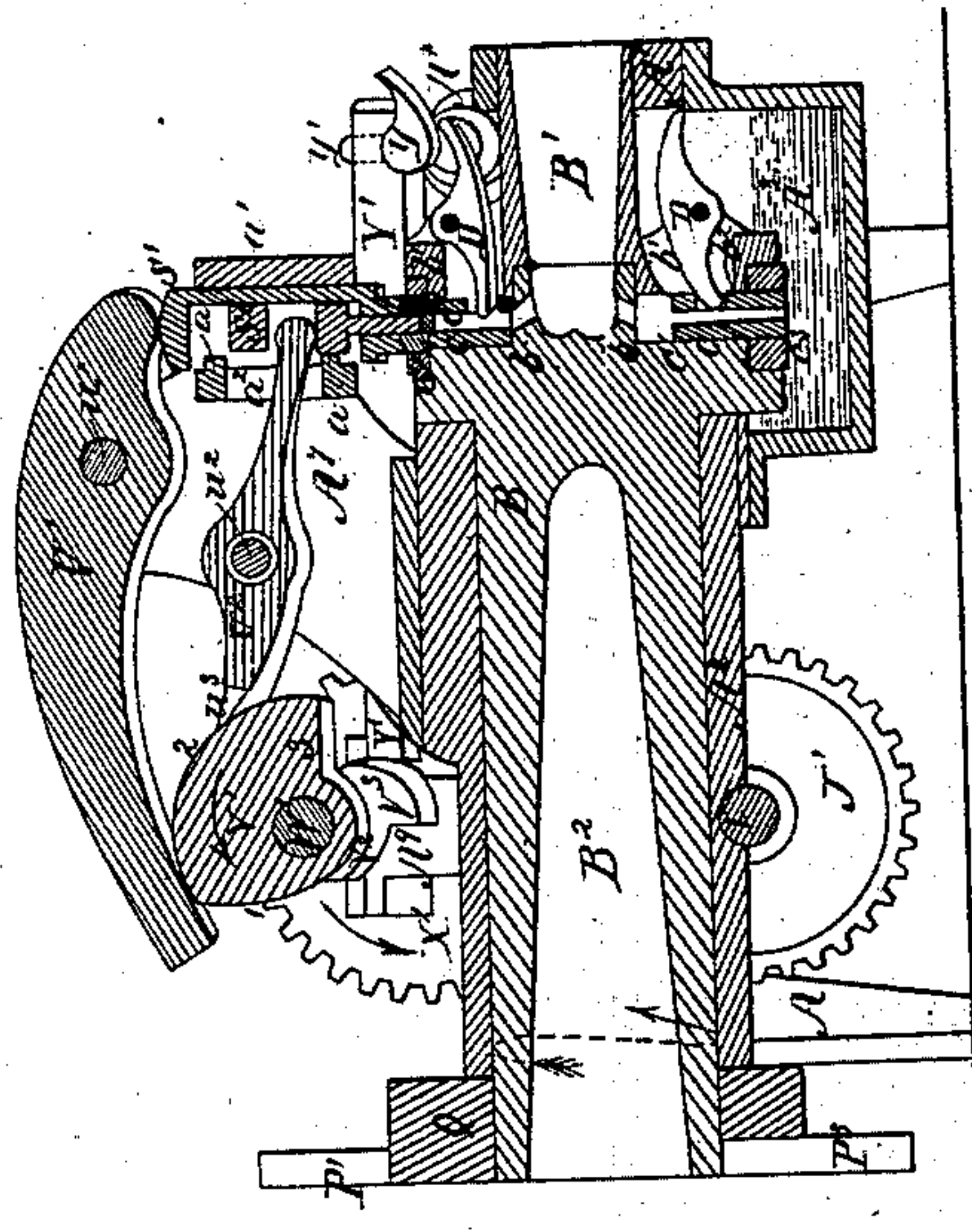


Fig. 4.

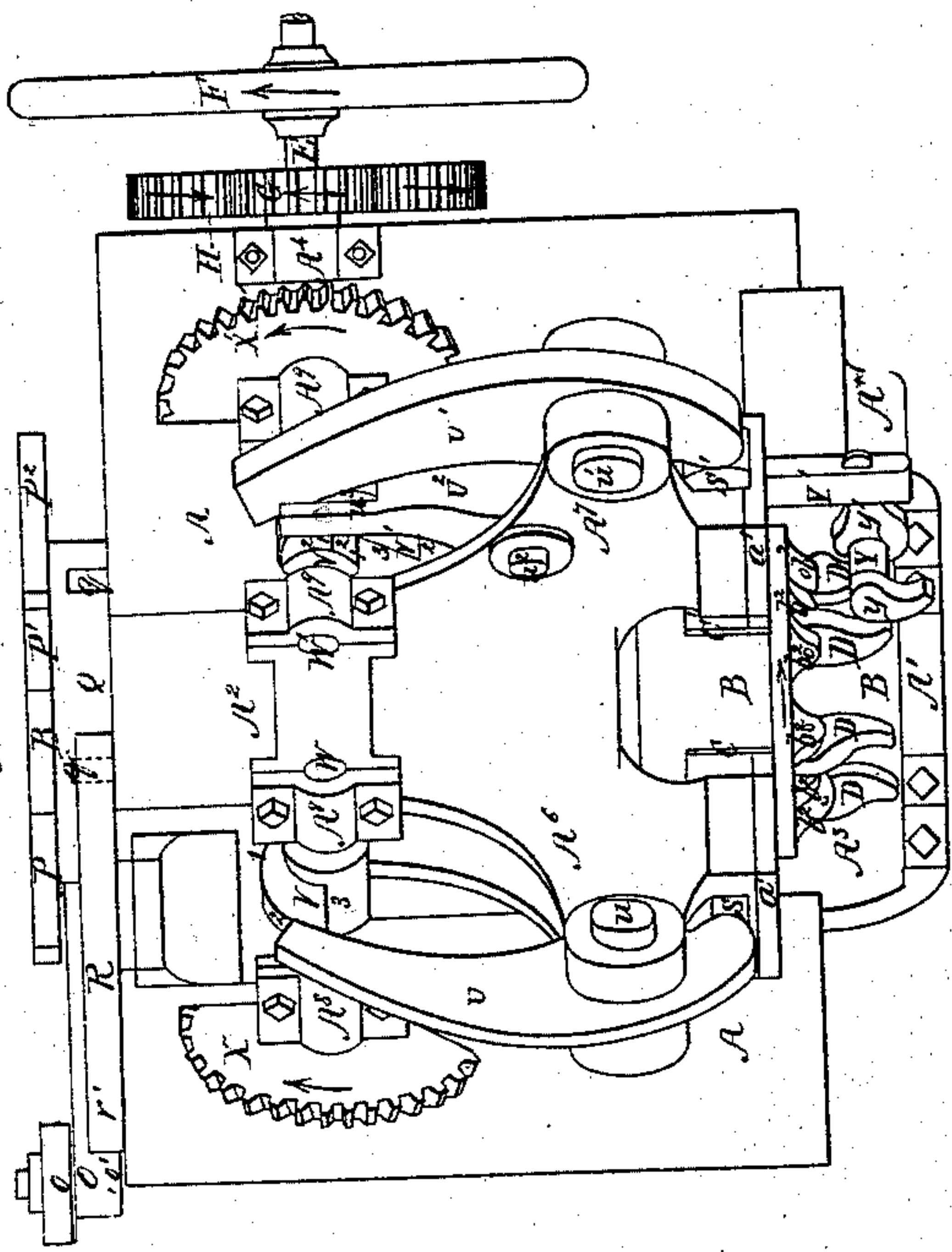


Fig. 1.

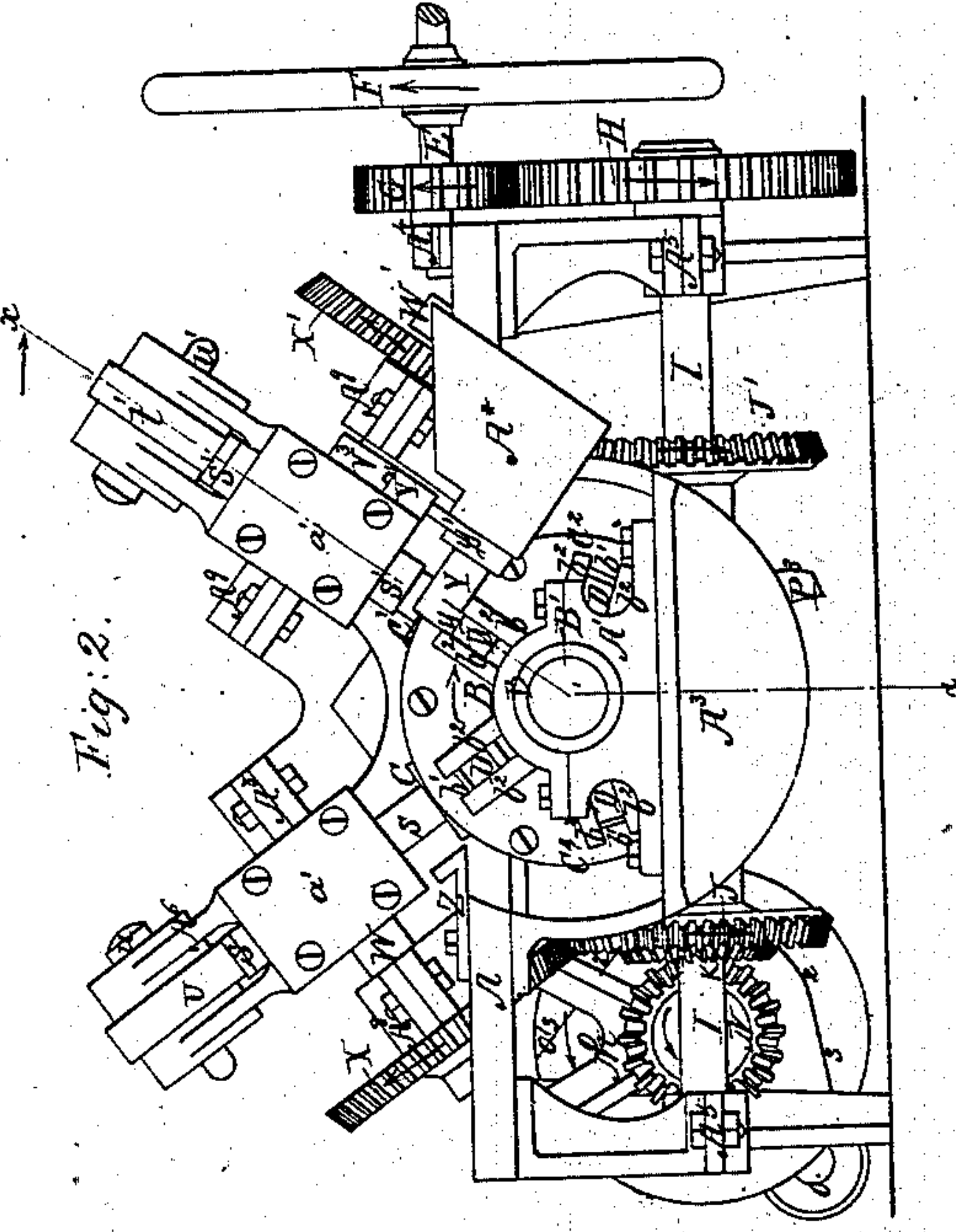


Fig. 2.

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EDWIN R. ADDISON, OF WHEELING, WEST VIRGINIA.

Letters Patent No. 80,108, dated July 21, 1868.

IMPROVED MACHINE FOR MAKING NUTS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, EDWIN R. ADDISON, of Wheeling, in the county of Ohio, and State of West Virginia, have invented a new and improved Nut-Machine; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, which is made a part of this specification.

The subject of my invention is a machine for making nuts by a continuous process from the heated bar, and is of that class of said machines in which the dies are contained in an intermittingly-revolving table, so arranged that the dies shall, at every revolution, pass through a reservoir of water to cool them.

In my machine the dies are arranged circumferentially of the table or bed, which consists of a large hollow or chambered roller, of suitable form, mounted horizontally in the frame, the punches being arranged radially above said table. The dies are provided with movable perforated bottoms, actuated by suitable mechanism to discharge the finished nuts from the dies previous to their immersion, and are connected with the interior of the table by suitable perforations, to allow of the discharge of the punchings therethrough. The operating-mechanism is so arranged as to form, at their simultaneous, or approximately simultaneous, operations, and discharge a nut at each interval between the movements of the table, thus, at each complete revolution of said table, turning out a number of finished nuts corresponding with the number of dies.

In the drawings—

Figure 1 is a plan view of my improved machine.

Figure 2 is a front elevation.

Figure 3 is a rear elevation.

Figure 4 represents a longitudinal section on the plane indicated by the line *x x*, fig. 2.

The frame A may be of any suitable form to support the operating parts. The revolving die-table B is mounted longitudinally of the frame A, its front end being journalled in the box A¹, and from immediately behind the die-table proper rests in the tubular portion, A², of said frame. It may consist of two portions, as shown, to facilitate the formation of the recesses for the dies, and of different diameters, to adapt it to best sustain the strain with the least weight of metal, its ends being chambered, as at B¹ and B², to further increase those qualities. The front chamber, B¹, further serves the purpose of a discharge for the punchings, as hereafter described.

The table is provided circumferentially with suitable recesses for the reception of the dies C C¹ C² C³ C⁴, and their movable bottoms, *c*. Perforations *b* connect the central perforations *c*¹ of said bottoms to the chamber B¹, through which the punchings are discharged, and slots *b*¹ are provided in the face of the table, connecting with the interior of the die-containing recesses, and terminating in pairs of lugs *b*², between which are pivoted levers D, by which the movable bottoms *c* are elevated, to discharge the finished nuts.

When the table is cast in two portions, as shown, (see fig. 4,) the slots *b*¹, lugs *b*², and a part of the recesses for the reception of the dies are formed in the front part, the major part of the main recesses and the perforations *b* being formed in the rear and principal part.

The front part of the frame A forms a trough or reservoir, A³, which is filled with water, in which the dies are consecutively immersed, after the nuts are discharged therefrom, for the purpose of cooling them, each die remaining in the water while the punching operations are being performed in the two above it.

E represents the driving-shaft, which is mounted at one end in the bearing A⁴, and has keyed to it a fly-wheel, F, and pinion G, the latter meshing with the large gear-wheel H, on the end of the shaft I, which is mounted in the bearings A⁵ A⁵, and has keyed to it bevel-gears J J¹ and K, the former of which impart the motion to the cams which operate the punching and discharging-devices, as hereinafter described, and the latter the device for imparting the requisite motion to the table, as follows:

L is a shaft, journalled in a suitable bearing in the extremity of the hanger M, at right angles to the shaft I, to which it is connected by the bevel-gear N, which meshes with the gear K on said shaft. A disk, O, is

mounted on the outer end of this shaft, and carries a friction-roller, o , which, at each revolution of the shafts I and L, engages with one of the curved radial arms, $P P^1 P^2 P^3 P^4$, of the die-table B, and imparts to said table a one-fifth revolution, bringing the die corresponding with the arm acted on under the first or severing-punch.

Q is a disk, of which the arms P, &c., may form parts, arranged immediately in front of said arms, and provided peripherally with notches q , corresponding with the number of said arms, which are engaged by a pawl, R, during the punching operation. The pawl R is pivoted at r , and its arm r^1 rests on the cam-periphery, o^1 of the disk O, said cam being composed of two regular curves, 1 2, connected by inclines 3. While the surface 1 is in contact with the arm r^1 , the pawl R is held firmly in one of the notches q , moved opposite it by the previous movement of said disk, and when the surface 2 is in contact it will be raised out of said notch, and the table be free to receive another movement from the roller o , which will by that time have come in contact with another of the arms P.

$A^6 A^7$ are standards of the frame A, arranged radially of the revolving die-table, and adapted to receive the punches and their operating-levers.

$S S^1$ are the principal punches, adapted, respectively, to sever the piece of metal and compress it in the die; and to form the crown on the upper surface of the nut, and hold it firmly in the die, while the perforating-punch S^2 , which slides within it, is being retracted. The standards $A^6 A^7$, for the reception of the punches $S S^1$, are formed with suitable ways or boxes at their front end, having inwardly-projecting studs, a , occupying a suitable recess in the rear side of said punches, to limit their movement, and removable fronts, a^1 , to allow of their insertion, the standard A^7 being provided with a slot, a^2 , in its rear side, for the passage of the actuating-lever of the inner punch S^2 .

The levers $U U^1$ for actuating the punches $S S^1$, are pivoted at u and u^1 , in their respective standards, and are operated by the cams $V V^1$. The actuating-lever U^2 of the punch S^2 , is pivoted at u^2 in the standard A^7 , and is operated by the cams V^2 on the sides of the cam V^1 , it being slotted at u^3 for the passage of said cam.

The cams $V V^1$ are constructed with an elevating eccentric-curve, 1, for imparting the downward movement to the plungers, and a regular curve, 2, concentric to the shaft, for holding the punches in their depressed position, said curve 2 commencing at the outer end of the incline 1, and connected to its inner end by an abrupt declivity, 3, for allowing the punches to rapidly retract at the conclusion of the punching and forming operations.

The respective lengths of the curves 1 and 2 of the cams $V V^1$ may be different, as it is necessary for the latter to hold the punch S^1 in its depressed position while the perforating-punch S^2 is being retracted, whereas the punch S may be released immediately on the termination of its effective stroke. The form of the cams V^2 is such that the effective movement of the punch S^2 shall commence subsequently and end previously to the commencement of the movements of its containing-punch S^1 , and may consist of a single evolute curve, 1, having its extremities connected by a radial line, 2. The cams $V V^1 V^2$ are mounted on shafts $W W^1$, journaled in bearings $A^8 A^8 A^9 A^9$, parallel to the pivots of the punch-operating levers, and provided on their lower or outer ends with bevel-gear wheels $X X^1$, which, passing through suitable slots in the frame provided for their reception, mesh with the bevel-gears $J J^1$, and receive through them a continuous rotary motion.

Y is a rock-shaft journaled in a hanger, A^* , of the frame A, at about right angles to the punch S^1 , and consequently to the axes of the dies, when under said punch. It is provided with a cam-arm, y , in the plane of the axes of the dies when in said position, which, on the retraction of the punches $S^1 S^2$, by the partial rotation of said shaft, depresses the outer end of the levers D, and elevates the bottoms c to throw out the finished nuts, a chute being there provided to receive the nuts and discharge them outside of the reservoir A^3 .

The rock-shaft Y receives its motion through an arm, y^1 , and sliding rod Y^1 , from a suitably-formed and arranged cam V^3 on the shaft W^1 . An adjustable guide, Z, may be attached to the frame, at a suitable point, to facilitate placing the bar of metal under the punch S.

The return-movements of the sliding rod Y^1 , levers $T T^1 T^2$, punches $S S^1$, and pawl R, may be made by springs or weights, suitably applied, or by substituting disks having corresponding cam-grooves for the cams, and connecting the parts not operated directly by said cams to their connecting-medium, by links or other suitable devices, the movements in both directions may be made positive.

Having thus described my invention, the following is what I claim as new, and desire to secure by Letters Patent:

1. The combination of the several punches herein described, and the dies on the periphery of the wheel B with the cavity B^1 , for the discharge of the punchings, all arranged and operating substantially as described.
2. The arrangement, in a die-wheel or shaft, which rotates in a vertical plane, of the cavity B^1 , passages b , and dies $C c c^1$, all substantially as set forth.
3. The combination of the disk O, having a cam-periphery, o^1 , and a friction-roller, o , the radial arms P, notched disk Q, and pawl R, with the table B, substantially as and for the purpose specified.

To the above specification of my invention, I have signed my hand, this seventh day of May, 1868.

E. R. ADDISON.

Witnesses:

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